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ABSTRACT

Test application and implementation of techniques and methods developed in the planning model, A Policy Information System for Vocational Education, are described in this report. (The computer planning model and policy information system designed for use in planning at the local level brings variables of student interest, manpower demand, enrollment projections, costs per program, placement, and other factors into a form so that they can be utilized to help administrators in long-range planning and decisionmaking.) A section of the report is devoted to each of the three sites in which the planning model was tested (Grand Rapids, Flint, and Battle Creek, Michigan), and the various problems and difficulties that occurred during the pilot test of the model are described. The implementation process is detailed, and differences between sites in organizational structure and test procedures are compared. Conclusions and recommendations are offered regarding the implementation process, and the model in general, which can be applied to the use of the model in other sites. (BL)

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ED143837

# IMPLEMENTING LONG-RANGE PLANNING FOR VOCATIONAL EDUCATION

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# IMPLEMENTING LONG-RANGE PLANNING

# FOR

# VOCATIONAL EDUCATION

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January, 1977

# IMPLEMENTING LONG-RANGE PLANNING FOR VOCATIONAL EDUCATION

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# ACKNOWLEDGMENTS

The preparation of this document was a joint effort of the Long-Range Vocational Education Project team. The interns presented their experiences on the implementation test to staff members at regular staff meetings and the group reacted with new ideas and information. The totality of this experience was the basis for what is contained herein. The various authors and their more specific responsibilities are described below.

Clifford Jump, Ph.D, John Martin, and Milton Miller were the three interns responsible for the field test of the project products. Clifford Jump was then the Director of the Calhoun Area Skill Center and is now Director of the Agricultural Technology Program at Michigan State University. John Martin is the Director of Placement for the Flint Community Schools, and Milt Miller is the Facilities Planner for the Grand Rapids School System. As the individuals overseeing the implementation effort in the three test cities, they were responsible for writing the initial drafts of the three sections contained herein. Milton Miller pulled together the three implementation studies and formulated the structure for the document.

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Other members of the project team who played important roles in the project include the following. Stephany Tornatzky, a graduate research assistant with academic backgroun in education and organizational communications, concentrated on the community input to vocational planning. Judy K Pfaff, research assistant with an educational background in systems science, mathematics and educational psychology, was a computer programming specialist for the project. Thomas E. Johnston, a research assistant with academic emphasis in labor relations, economics and social science and supervisory experience in industry, focused on the concerns of the unemployed and underemployed. Jeffrey Crause, a graduate student in the School of Urban Planning, investigated planning region boundaries, and Scott Ramsey completed much of the computer programming for the project.

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Richard Featherstone, Ph.D., is a professor at Michigan State University with a long-standing interest and expertise in the planning of educational systems. He has been a research fellow at the NCHEMS and is the former chairman of the Department of Administration and Higher Education in the College of Education at Michigan State University. He spent many years as the chief administrative officer of urban school systems before becoming a professor. Dr. Featherstone acted as a faculty consultant to the project throughout its eighteen-month duration and served to educate all involved to the theory and practice of educational planning while making specific contributions to several of the project products.

Donald Hanna is a member of the faculty of the College of Engineering at Michigan State University. His background includes several years of teaching and administration in secondary and continuing education in both domestic and foreign settings. Mr. Hanna focused on the student interest component of the system.

## INTRODUCTION

During the period from July, 1975 through December, 1976 the Middle Cities Education Association based in East Lansing, Michigan was contracted by the U.S. Office of Education to design, and test a planning model to aid educators in the process of long-range planning for vocational education at the local level. Initial efforts were aimed at developing a computer planning model and policy information system which would bring the variables of student interest, manpower demand, enrollment projections, costs per program, placements and other factors into a form so that they could be utilized to help administrators in long-range planning and decision-making. One of the basic assumptions of the project was the fact that there has been a lack of planning technology or tradition in the field of vocational education that is able to incorporate these factors into decision-making.

Putting together a model on the steps one can take to perform long-range planning for vocational education is one thing, while testing and getting the model to work in the everyday world of vocational education is quite another matter. From the outset, the project staff realized it would have to design a program that would confront some of the major deterrents to planning. These were listed as: (1) lack of time, training, technology, data, and money to carry on the planning activity; and (2) overcoming the resistance to change of established programs, staff, and facilities when it became obvious that changes should occur. Implementation

is often the most difficult stage of the planning process and the step where many planners fail in their efforts. It is the step where proposed plans intersect with the lives of people along with the values, perceptions and in-grained interests and ways of doing things held by people, institutions, and bureaucracies.

In light of these issues, the Middle Cities project provided for a "pilot test" in three different types of communities where vocational education programs were being offered including an industrial city, a relatively rural county with a medium-sized city, and a diversified county with a large city, surrounding suburbs and small rural areas. The three test sites ultimately selected were the city of Flint, Calhoun County where Battle Creek is located, and Kent County where the city of Grand Rapids is located.

During the first three months of the project and before the pilot test, data elements necessary for planning were identified. In constructing a model that could be utilized by the local vocational educational agency, the staff set about identifying which elements were relevant to the planning process and to what extent each of the elements--labor market demand, students interest, educational resources, and others--should be weighted. The planning model, its technology and assumptions about the data base and planning organization were very flexible at the time the field tests began. In effect, the pilot test was designed to aid in developing the planning model and its components rather than to test a pre-existent model.

*Selecting The Test Sites*

During the fourth month of the project, the implementation task force and advisory council developed a plan for each of the three test sites. The advisory council for the Middle Cities project was made up of individuals with an interest or experience in vocational education. At this stage, the selection of three sites in the state of Michigan was completed in order to implement the planning model. The sites chosen included an industrial city, a rural-urban county with a medium-sized city, and a county with a large city and a diverse labor market.

Flint was selected as the industrial city. It has a population of nearly 200,000 and automobile manufacturing and related industries account for about 80 per cent of total manufacturing employment. Its economic base was described as the least diverse of the 93 major labor markets in America of over 20,000 employees each in a study of the industrial mix reported in Stuart Chapin's Urban Land Use Planning. Calhoun County and the city of Battle Creek were chosen as the rural county with a medium-sized city. Best known as the home of a large cereal manufacturing company, transportation equipment, food processing, and other agriculturally-related industries comprise the major sources of employment in Battle Creek and Calhoun County. Grand Rapids, a city of 200,000 is located in the southwest corner of Kent County and was selected as the third site. The city is surrounded by suburban communities, townships, forming a metropolis of more than half a million people. Other small towns are scattered through the northern and eastern rural areas making Kent County

the most diverse site in terms of its demography and its labor market. No one or two industries dominate employment in Grand Rapids and Kent County. Furniture making, primary metals, fabricated metals, machinery, food processing, textiles and apparel, printing and publishing, and chemicals are all significant local sources of employment.

Three doctoral candidates in education at Michigan State University were selected as project interns to aid in the implementation of the pilot test. Each intern had direct responsibilities within a local educational agency in one of the three test sites of Flint, Grand Rapids, and Battle Creek. During the implementation period, Jack Martin served as Placement Director for the Flint Schools, Milton Miller was the Facilities Planner for the Grand Rapids Schools, and Clifford Jump served as Director of the Calhoun Area Skill Center located in Battle Creek.

These interns had a comprehensive knowledge of vocational programs being offered in their communities and could readily identify and enlist support and assistance from local staffs for carrying on the test. In addition, superintendents from these three districts were members of the project advisory committee and added another dimension of expertise to efforts at each of the three project sites.

*Procedures*

Three different approaches were selected to provide a variety of experiences during the test period. At the Flint site, the program was tested for twelve vocational programs which are offered to 11th and 12th

graders in the system. In the Kent County and Grand Rapids study, the intent was to make a more comprehensive survey of various levels of vocational instruction to determine the interactions and impact of multiple efforts on the labor market and individual programs. To accomplish this, all 11th and 12th grade students enrolled in the area skill center and city high schools, as well as junior college technical students were included.

In contrast to the Flint and Calhoun County tests, only four vocational programs were tested in the Kent County-Grand Rapids test. In all three test sites the labor market was considered to be as large or larger than the metropolitan area as defined by the Standard Metropolitan Statistical Area (SMSA). It became evident during the course of the study that the labor market area varies according to the trade or occupation under consideration. For instance, the labor market area for an auto mechanic or child care worker is generally larger than the labor market for a welder or industrial mechanic where employment opportunities are generally confined to a specific urban area.

The pilot test was designed to: 1) identify organizational problems related to analysis and planning, 2) discover problems related to developing a data base, and 3) test and modify the evolving computer programs for long-range planning for vocational education. Superintendents and interns from participating districts hoped that the pilot test would help them identify and discover inefficiencies in current programs or new and emerging labor market opportunities. A review and analysis of each of the tests follows.

## FLINT TEST

*Procedures*

Taking into account just the 11th and 12th grade students enrolled in vocational programs in the four Flint high schools, the Flint test was designed to assess the planning process in a purely urban school system, one common type of system for the delivery of vocational education in the United States. Many Flint 11th and 12th graders are also enrolled in a county-wide skill center vocational program, but were not included in the Flint test. Many of the 12 vocational programs included in the test are also offered by the area skill center which draws students from Flint and a number of suburban and rural school districts in outlying Genessee County. Similar programs are offered because there are not enough openings in the skill center for all of the Flint students and in cases where there are sufficient numbers interested in a vocational program to have it offered at a local high school. Although the pilot test analyzed only vocational programs in the Flint schools, the labor market was considered to be the entire Flint SMSA which encompasses two counties and several dozen school districts.

The two people directly involved in the test were the project intern, who also served as the Flint Schools Placement Director and the school system's Director of Vocational Education, and the Flint school superintendent who was a member of the project advisory council and the planner for the school system. The twelve programs included in the test were General Merchandising, Nurse Aide, Food Management,

Clerk/Stenographer, Auto Body, Auto Mechanics, Custodial Services, Electronics, Graphic Arts, Machine Shop, Welding, and Small Engine Repair. Data on past enrollments, placement, and interest in these vocational programs was readily available from school records and state reports. The researchers would have preferred to use other sources such as Michigan Employment Security Commission information for determining manpower needs, however, that agency's occupational projections were not easily correlated with vocational program descriptions. This is a common problem facing vocational administrators who attempt to match occupational and employment projections made by governmental agencies with individual vocational programs.

The emphasis in the Flint test was on putting pre-existing data into the computer in order to test the planning model rather than using outcomes to assist the vocational director in making decisions. Tests were conducted during the period of January through May, 1976. In some instances, the figures shown for placements are based on estimates. Data collected by the Flint researchers is summarized in Table 1.

*Student Interest*

The first element the computer program tested and analyzed was the factor of student interest, or the attempt to predict the level of interest in a particular vocational education curriculum on the part of future students. Three measures of student interest were readily available to the Flint researchers. The Ohio Vocational Interest Survey (OVIS) is used

CENTRAL CITY
TOTAL ANTICIPATED ENROLLMENT -C
TOTAL ANTICIPATED REVENUE -C

YEAR 74-75
LIST IN ORDER BY GOAL 1

THE PROGRAM WITH THE HIGHEST STUDENT INTEREST WILL APPEAR FIRST ON DOWN TO THE PROGRAM WITH THE LEAST.

| | | | 1 STUDENT INTEREST | 2 PROJECTED SKILL RELATED PLACEMENT | 3 TRAINING STATIONS AVAILABLE | 4 STAFF COSTS | 5 ALL OTHER COSTS | 6 ANTICIPATED REIMBURSE-MENT** | 7 LOCAL COSTS 4+5-6 | 8 CUMULATIVE LOCAL COSTS | 9 LOCAL COSTS PER PUPIL 7/3 | RANKS FOR NUMBER OF STUDENTS 1 2 3 | COLUMNS 7 9 COSTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S T U D E N T S | | | N E A R E S T | D O O L L A R | | C O S T S | | | H TO L | L TO H |
| 2 | 07.0303 | NURSE AIDE | 560 | 20 | 52 | 16572 | 0 | 6775 | 9797 | 9797 | 158 | 1 5 4 | 7 8 |
| 4 | 14.9800 | CLERK/STENO | 4[illegible] | 100 | 315 | 67[illegible]26 | 7594 | 17100 | 57520 | 67317 | 183 | 2 2 2 | 12 6 |
| 1 | 04.0601 | GEN MERCH | 37[illegible] | 11[illegible] | 37[illegible] | 64946 | [illegible] | 16437 | 48509 | 115826 | 131 | 1 1 1 | 11 4 |
| 6 | 17.6302 | AUTO MECH | 285 | 45 | 180 | 70134 | 99 | 43320 | 26913 | 142739 | 150 | 3 3 3 | 10 5 |
| 5 | 17.0301 | AUTO BODY | 246 | 10 | 24 | 15779 | 4956 | 6110 | 14625 | 157364 | 609 | 5 8 10 | 8 12 |
| 8 | 17.1501 | ELECTRONICS | 21[illegible] | 8 | 44 | 17401 | 403 | 1196 | 16608 | 173972 | 3[illegible] | 6 10 7 | 9 10 |
| 10 | 17.2302 | MACH SHOP | [illegible]1 | 7 | 25 | 6586 | 99 | 11011 | -4326 | 169646 | -17[illegible] | 7 11 8 | 1 1 |
| 11 | 17.2306 | WELDING | 126 | 12 | 51 | 11144 | 4653 | 17099 | -1302 | 168344 | -2[illegible] | 8 7 5 | 2 2 |
| 3 | 09.0203 | FOOD MGT. | 108 | 30 | 47 | 19410 | 675 | 18634 | 1451 | 169795 | 31 | 9 4 6 | 3 3 |
| 9 | 17.1900 | GRAPHIC ARTS | 90 | 9 | 24 | 9103 | 1354 | 785 | 9672 | 179467 | 40[illegible] | 10 9 9 | 6 11 |
| 7 | 17.1100 | CUSTODIAL SE | 40 | 15 | 20 | 3732 | 613 | 661 | 3684 | 183151 | 1[illegible]4 | 11 6 12 | 4 7 |
| 12 | 17.3101 | SMALL ENG. | [illegible]5 | 5 | 23 | 5051 | 3969 | 785 | 8234 | 191385 | 3[illegible] | 12 12 11 | 5 9 |
| | | TOTALS | 2593 | 371 | 1175 | 3[illegible]6884 | 24414 | 139913 | | 191385 | 163 | | |

** INCLUDES STATE AID

TABLE I

8

to determine the occupational interests of all eighth grade students and the Boy Scout Career Interest Survey is used to study the vocational interests of 10th, 11th and 12th graders. These surveys which measure "expressed" interest were compared with demonstrated interest as measured by actual 1974-75 enrollments. Actual enrollment is given in column three under "Training Stations Available". From figures obtained from these three measures, a factor of "Student Interest" was developed and placed in column one.

True student interest is difficult to measure by analyzing only enrollments because some classes are over-subscribed due to the fact that some students were not able to enroll in their first choice. Adjustments would be required to show that more students were interested than were enrolled in the programs such as auto mechanics, welding, auto body repair, and electronics. Unfortunately, there is no measure of the "real" vocational interests of those students who were enrolled in programs of their second or third choice. With regard to the OVIS instrument, the researchers noted that occupational interests change between the eighth grade and the 11th grade and that "expressed" interest preceding enrollment is not a reliable predictor.

To a certain extent projections of student interest can be tied to enrollment projections, however, assumptions that increases or decreases in vocational education program enrollment will be proportional to an increase or decrease in total enrollment must be made cautiously. Certain programs probably do exhibit a static rate of student interest, others

can fluctuate rapidly with perceived changes in employment opportunities and other factors. In addition, interest in vocational education on the whole seems to be growing nationwide relative to other educational programs at the high school level. Because of these limitations, the Flint researchers did not use enrollment projections to modify the student interest number.

*Employment Demand*

Occupational or manpower demand at the local level was measured by analyzing the district's follow-up studies and placement records to determine the number of students placed in jobs for which they were specifically trained for job-related occupations. By comparing student enrollment--designated in the computer program as "training stations available", with "placement", it might appear that the district is preparing students for jobs that don't exist or at least are open to recent program graduates by a rate of 3 to 1 (compare 1171 to 371). How can the researcher reconcile this difference? Should these numbers be the same? Probably not, for a great variety of reasons.

First of all, not all students enroll in vocational programs soley for the purpose of obtaining training for a specific job. To a significant number of students, vocational education can mean gaining a practical skill that will be useful outside the world of work (such as auto mechanics). To others it can mean exposure to a group of occupations or cluster that represents the general career choice and aspirations of the individual. In addition, in the Flint study, placement was the sole

measure of employment demand because occupational projections and current labor market demand as measured by the state employment agency were difficult to correlate with vocational categories. The actual demand for jobs relating to the vocational education programs might be much higher than is indicated by placement records.

The ratios between enrollment in individual programs and the placement rate for each of the programs might be of greater interest to the planner. These figures are shown in Table II.

TABLE II
STUDENT INTEREST AND JOB PLACEMENT OF SELECTED OCCUPATIONS
FLINT PUBLIC SCHOOLS 1974-75

| | | | |
|---|---|---|---|
| General Merchandising | 3 to 1 | Custodial Services | 1.3 to 1 |
| Nurses Aide | 2.6 to 1 | Electronic | 5.5 to 1 |
| Food Management | 1.6 to 1 | Graphic Arts | 2.7 to 1 |
| Clerk/Steno | 3 to 1 | Machine Shop | 3.6 to 1 |
| Auto Body | 2.4 to 1 | Welding | 4.2 to 1 |
| Auto Mechanics | 4 to 1 | Small Engines | 4.6 to 1 |

These ratios, as computed, are misleading in that placement is based on the total labor market, and the vocational program in the Flint High Schools is only one supplier of trained workers. Even so, the vocational planner might assume that a very high ratio in a certain program indicates an over supply of trained workers in that area. Perhaps training institutions in the region as a whole are training many more workers than the market can support and greater coordination is needed between institutions.

Placement figures and ratios are in no sense precise indicators of how well a program is meeting student and labor market needs, because so

many other variables enter into the question of placement. Many vocational education students have no intention of entering the labor market immediately after graduation from high school. Some plan to seek additional academic or vocational training. Others enter the armed services, while others marry and raise families. How a school district defines placement will determine whether or not some of these additional variables are entered as "placements". Flint defines placement in the traditional sense of placement into the occupation for which the student was trained.

A very low ratio may not indicate that the job market is saturated or placement flooded. It probably means only that by using these two rather "pure" measures, the number being trained and the number placed are in an acceptable relationship. Taking into account that some students will enroll in vocational programs for other reasons than job placement in that field, these ratios are useful in identifying which programs seem to be in an acceptable equilibrium with labor market demand and which programs appear to require adjustment.

These examples and the testing illustrate a need to find determinants that could become standardized by repeated application and testing and thereby become reliable predictors for planning. It is not suggested that the best determinant of student interest is enrollment history or that placement history is a good measure of the labor market, however, if they are used repeatedly over a period of years, they could become reliable determinants for planning. A standardized interest survey

or some other measure, not yet devised, or a combination of interest measures could also be used to ascertain an interest value. Placement history is not the only determinant for gauging labor market demand. In fact, it is of relatively little value when industries rise and fall in a local labor market. This is particularily true in a labor market such as Flint which is totally dependent on the fortunes of the automobile industry which accounts for nearly 90 per cent of local manufacturing employment. When the automobile industry is in a recession like it was during the period of 1974-75 when these placement figures were gathered, all local business and industry also face a decline. The 1974-75 recession could in fact be a major reason why the enrollment to placement ratios in Flint were so high.

Other modules in the Flint test for which data were obtained were facilities, staff costs, other costs, and vocational reimbursement. All of these data, the researchers said, were available from school district records or from state reports. The data were gathered and placed in the proper columns. Since all modules are related to program costs they were accumulated and summarized to determine annual cost per pupil, by program. The planner can discover programs where costs are disproportionately high or low, thereby noting those which need to be carefully scrutinized for program or management results.

Table I summarizes the total local cost per trainee implying that if the local district is paying a large share of the cost, the program should be reviewed carefully. Conversely, if there is little or no local

support required or if there is a "profit" from federal support, the program should be continued (see machine shop which shows that there was $172 more federal support than there was cost).

Two other factors should be considered, taking into account all the variables that can effect placement. They are cost per trainee, and the cost per placement. Table III shows these costs based on the total cost of each program rather than the local cost only.

TABLE III
COST SUMMARY FOR TWELVE FLINT PUBLIC SCHOOLS VOCATIONAL PROGRAMS
1975-76

| PROGRAM | STAFF COSTS | ALL OTHER COSTS | TOTAL COSTS | NO. OF TRAINEES | COST/ TRAINEE | EXPECTED PLACEMENT | COST/ TRAINEE PLACED |
|---|---|---|---|---|---|---|---|
| 1 Gen Merch. | $64,946 | $ -0- | $64,946 | 370 | $176 | 110 | $ 636 |
| 2 Nurses Aide | 16,572 | -0- | 16,572 | 52 | 319 | 20 | 829 |
| 3 Food Mgt. | 19,410 | 675 | 20,085 | 47 | 427 | 30 | 670 |
| 4 Clerk/Steno | 67,026 | 7,594 | 74,620 | 315 | 237 | 100 | 746 |
| 5 Auto Body | 15,779 | 4,956 | 20,735 | 24 | 864 | 10 | 2,074 |
| 6 Auto Mech. | 70,134 | 99 | 70,233 | 180 | 390 | 45 | 1,561 |
| 7 Cust. Serv. | 3,732 | 613 | 4,345 | 20 | 217 | 15 | 290 |
| 8 Electronics | 17,410 | 403 | 17,804 | 44 | 405 | 8 | 2,226 |
| 9 Graph. Arts | 9,103 | 1,354 | 10,457 | 24 | 436 | 9 | 1,162 |
| 10 Mach. Shop | 6,586 | 99 | 6,685 | 25 | 267 | 7 | 955 |
| 11 Welding | 11,144 | 4,653 | 15,797 | 57 | 310 | 12 | 1,316 |
| 12 Small Eng. | 5,051 | 3,968 | 9,019 | 23 | 392 | 5 | 225 |
| Totals | $306,884 | $24,414 | $331,298 | $1,175 | $282 | 371 | $893 |

Note that the average cost per trainee is $282 and the average cost per placement is $893. The range of cost per student is $176 for nurses' aide training to $864 for auto body repair training. The range in cost for each student placed is from $225 for small engine repair to $2,226 for

electronics repairmen. This wide range of program costs must be reconciled. The planner may ask how local costs differ from state or national averages or costs reported by other institutions for similar programs. If they vary widely from these averages and norms he must carefully analyze all aspects of the "maverick" program. Why is the cost disproportionately high or low? Is it caused by a low teacher/student ratio, a facility that is costly to operate, or some other problem? When the causes are discovered, corrective action can be taken. Perhaps the instruction should be given "on site" rather than in a school or perhaps less costly methods of instruction should be considered. Is the program overstaffed? Are there excessive numbers of students who drop out after two or three weeks?

There is little doubt that basic cost data is easily obtained from existing reports and that it can be organized to provide the planner with valuable information. Planning decisions can save money or provide dollars for new programs by reallocating resources, facilities, staff and materials.

Table IV represents an attempt to give the planner specific direction concerning how a desirable balance between interest, placement and facilities can be achieved. All cost information is removed from consideration. The "ideal" number of training stations needed (Column 11) was found by dividing placement (Column 2) by "desired" placement (Column 5). The "ideal" number of students interested (Column 10) was determined by dividing "ideal" training stations (Column 11) by "desired" interest number (Column 4).

TOTAL ANTICIPATED ENROLLMENT =0
TOTAL ANTICIPATED REVENUE =0

YEAR 74-75
LIST IN ORDER BY GOAL 6

TABLE IV

FLINT



| | | | 1 STUDENT INTEREST | 2 PROJECTED SKILL RELATED PLACEMENT | 3 TRAINING STATIONS AVAILABLE | 4 DESIRABLE STUDENT INTEREST RATIO | 5 DESIRABLE SKILL RELATED PLACEMENT | 6 REDUCE TRAINING STATIONS BY | 7 TRY TO ENCOURAGE STUDENT INTEREST | 8 TRY TO DIVERT STUDENT INTEREST | 9 INCREASE TRAINING STATIONS BY | 10 IDEAL NUMBER OF STUDENTS INTERESTED | 11 IDEAL NUMBER OF TRAINING STATIONS AVAILABLE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S T U D E N T S - | | | P E R C E N T S - | | N U M B E R S O F | | S T U D E N T S - | | | |
| 1 | 04.180[illegible] | GEN MERCH | 37[illegible] | 11[illegible] | 37[illegible] | 15[illegible] | [illegible] | 95 | 43 | 0 | 0 | 413 | 275 |
| 2 | 07.[illegible]3[illegible] | NURSE AIDE | 56[illegible] | [illegible] | 52 | 150 | [illegible] | 2 | 0 | 485 | 0 | 75 | 50 |
| 3 | 09.[illegible]203 | FOOD MGT. | 11[illegible] | [illegible] | 47 | 150 | [illegible] | [illegible] | 5 | [illegible] | 28 | 113 | 75 |
| 4 | 14.380[illegible] | CLERK/STENO | 46[illegible] | 10[illegible] | 315 | 15[illegible] | [illegible] | 65 | 0 | 25 | 0 | 375 | 250 |
| 5 | 17.0301 | AUTO BODY | 24[illegible] | 1[illegible] | 24 | 15[illegible] | [illegible] | 0 | 0 | 202 | 1 | 38 | 25 |
| 6 | 17.0302 | AUTO MECH | 28[illegible] | 4[illegible] | 180 | 15[illegible] | [illegible] | 67 | 0 | 115 | 0 | 170 | 113 |
| 7 | 17.[illegible]4[illegible] | CUSTODIAL SE | 4[illegible] | 15 | 2[illegible] | 15[illegible] | [illegible] | [illegible] | 17 | [illegible] | 18 | 57 | 38 |
| 8 | 17.150[illegible] | ELECTRONICS | 21[illegible] | [illegible] | 44 | 15[illegible] | [illegible] | 24 | 0 | 186 | 0 | 30 | 20 |
| 9 | 17.190[illegible] | GRAPHIC ARTS | 9[illegible] | 9 | 24 | 15[illegible] | [illegible] | 2 | 0 | 57 | 0 | 33 | 22 |
| 10 | 17.2302 | MACH SHOP | 13[illegible] | 7 | 25 | 15[illegible] | [illegible] | 8 | 0 | 104 | 0 | 26 | 17 |
| 11 | 17.2306 | WELDING | 12[illegible] | 12 | 51 | 15[illegible] | [illegible] | 21 | 0 | 75 | 0 | 45 | 30 |
| 12 | 17.3104 | SMALL ENG. | 4[illegible] | 5 | 23 | 15[illegible] | [illegible] | 10 | 0 | 20 | 0 | 21 | 13 |
| | | TOTALS | 2593 | 371 | 1175 | | | 294 | 65 | 1263 | 47 | 1395 | 928 |

The desired placement and interest numbers were established by planning consensus after careful study of the projected interest level and projected occupational demand.

Columns 6 through 9 in Table IV direct the planner to consider four possible actions:

a. Reduce teaching stations
b. Encourage student interest
c. Divert student interest
d. Increase training stations

Numbers in these columns represent trainees and training stations. By reducing training stations, enrollments will be decreased. Whether this action can be considered "diverting" student interest or not is questionable but the net effect is the same. It is not likely that students will shift from nurses' aide, auto body repairmen, and electronics to general merchandising and custodial service. Obviously the 1263, whose interest is to be diverted cannot all be encouraged to go into the 65 openings shown on the table. The value of this analysis is two-fold. When used in its present form it helps the planner identify trouble spots and it provides an example of computerized data manipulation which may help the planner find new and creative ways to use available information.

## CALHOUN COUNTY - BATTLE CREEK AREA TEST

Thirteen school districts are combined in the Calhoun County Intermediate School District. The Intermediate School District in Michigan is a conglomeration of school districts on a county or regional level to provide area wide support services and specifically vocational and special education. The aim is to combine resources for these higher cost programs to achieve economies of scale. Battle Creek Public Schools operates the area skill or vocational center for the Calhoun Intermediate School district. This skill center offers vocational programs to all 11th and 12th grade students on an elective basis.

*Procedures*

As in most labor markets workers are trained in several institutions for the Battle Creek labor market but only those trained at the skill center were included in the test. All twenty-five Skill Center programs were considered in the study which analyzed the same variables analyzed in the Flint test.

Table V summarizes student interest, placement, and costs of these programs.

The student interest number for the Battle Creek area was determined by examining the five-year enrollment history by program. The researcher averaged the five-year history and then "weighted" the last two years to project the expected interest for the 1976-77 school year.

VALLEY SCHOOLS

TOTAL ANTICIPATED ENROLLMENT 3000

TOTAL ANTICIPATED REVENUE -2

YEAR 1976

| | | 1 STUDENT INTEREST | 2 PROJECTED SKILL RELATED PLACEMENT | 3 TRAINING STATIONS AVAILABLE | 4 STAFF COSTS | 5 ALL OTHER COSTS* | 6 ANTICIPATED REIMBURSEMENT** | 7 LOCAL COSTS 4+5-6 | 8 CUMULATIVE LOCAL COSTS | 9 LOCAL COSTS PER PUPIL 7/3 | RANKS FOR COLUMNS 7 9 1 2 3 NUMBER OF STUDENTS | | | COSTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S T U D E N T S | N E A R E S T D O L L A R C O S T S | | | | | | | | L TO H | H TO L | | L TO H | |
| 1 | AGRICMECHANICS | 3[illegible] | 15 | 48 | 23305 | 350[illegible] | 1320 | 2548[illegible] | 25480 | 531 | 15 | 11 | 16 | 20 | 19 |
| 2 | AIRCONDITIONREFRIG | 4[illegible] | 5 | 48 | 17200 | 2400 | 1110 | 18490 | 43970 | 385 | 17 | 24 | 15 | 14 | 11 |
| 3 | AUTOBODY | 6[illegible] | 9 | 48 | 20800 | 7000 | 1230 | 26570 | 70540 | 664 | 12 | 21 | 19 | 21 | 24 |
| 4 | ACCOUNTING | | 14 | 30 | 11500 | 2200 | 6912 | 6788 | 77328 | 226 | 19 | 16 | 23 | 4 | 6 |
| 5 | AUTOMECHANICS | 12[illegible] | 12 | 80 | 55800 | 5100 | 26544 | 34356 | 111684 | 429 | 4 | 10 | 5 | 22 | 15 |
| 6 | CARPENTRY | 8[illegible] | 14 | 60 | 18336 | 3500 | 26352 | -4516 | 107168 | -74 | 9 | 15 | 10 | 1 | 1 |
| 7 | CHILDCARE | 6[illegible] | 8 | 48 | 27500 | 1200 | 9108 | 19592 | 126760 | 408 | 11 | 22 | 13 | 15 | 12 |
| 8 | COSMETOLOGY | 10[illegible] | 62 | 80 | 20600 | 2900 | 11340 | 12160 | 139920 | 152 | 5 | 4 | 4 | 7 | 4 |
| 9 | DATAPROCESSING | 9[illegible] | 43 | 50 | 21800 | 27900 | 29025 | 20675 | 159595 | 414 | 6 | 5 | 12 | 18 | 13 |
| 10 | DRAFTING | 4[illegible] | 16 | 60 | 17000 | 2800 | 1470 | 18330 | 177925 | 306 | 16 | 18 | 7 | 12 | 10 |
| 11 | ELECTRICITY | 4[illegible] | 11 | 40 | 19336 | 2900 | 17343 | 4893 | 182818 | 122 | 18 | 17 | 18 | 3 | 3 |
| 12 | ELECTRONICS | 9[illegible] | 15 | 48 | 21488 | 4300 | 1230 | 24558 | 207376 | 512 | 14 | 14 | 14 | 19 | 18 |
| 13 | FOODSERVICE | 12[illegible] | 75 | 90 | 60488 | 7500 | 30504 | 37484 | 244860 | 416 | 1 | 3 | 3 | 23 | 16 |
| 14 | FLOORCOVERING | 1[illegible] | 5 | 30 | 15700 | 2200 | 480 | 18420 | 263280 | 614 | 25 | 25 | 25 | 13 | 22 |
| 15 | INDMACHINES | 3[illegible] | 3[illegible] | 60 | 23900 | 8000 | 33000 | -1100 | 262180 | -17 | 13 | 9 | 9 | 2 | 2 |
| 16 | INSTMOMENGT | 2[illegible] | 15 | 30 | 19700 | 1050[illegible] | 360 | 20390 | 282570 | 680 | 24 | 13 | 21 | 17 | 25 |
| 17 | LANDSCAPEHORT | 8[illegible] | 15 | 60 | 15230 | 340[illegible] | 1320 | 18310 | 300880 | 458 | 8 | 12 | 20 | 11 | 17 |
| 18 | HEALTHOCC | 12[illegible] | 8[illegible] | 100 | 54100 | 55000 | 16728 | 42872 | 343752 | 429 | 3 | 2 | 2 | 24 | 16 |
| 19 | RETAILMARKETING | 7[illegible] | 3[illegible] | 50 | 14[illegible]00 | 2500 | 8448 | 8052 | 351804 | 161 | 10 | 7 | 11 | 5 | 5 |
| 20 | SECRETARIAL | 12[illegible] | 120 | 100 | 56432 | 18495 | 18348 | 56579 | 408383 | 566 | 2 | 1 | 1 | 25 | 21 |
| 21 | GRAPHICSPRINGING | 3[illegible] | 1[illegible] | 60 | 11606 | 6300 | 840 | 17066 | 425449 | 284 | 22 | 20 | 8 | 10 | 9 |
| 22 | GRAPHICSCOMMART | 3[illegible] | 8 | 60 | 14700 | 2200 | 840 | 16060 | 441509 | 268 | 20 | 23 | 6 | 8 | 8 |
| 23 | BLDGMAIN | 2[illegible] | 3[illegible] | 30 | 16762 | 600 | 450 | 16912 | 458415 | 564 | 23 | 8 | 24 | 9 | 20 |
| 24 | WELDING | 8[illegible] | 35 | 40 | 25500 | 4500 | 19494 | 10506 | 468921 | 263 | 7 | 6 | 17 | 6 | 7 |
| 25 | PLUMBING | 3[illegible] | 1[illegible] | 30 | 20688 | 4[illegible]00 | 4860 | 19828 | 488749 | 661 | 21 | 19 | 22 | 16 | 23 |
| | TOTALS | 1565 | 683 | 1352 | 625460 | 131945 | 268656 | | 488749 | 362 | | | | | |

* INCLUDES CAPITAL COSTS

** INCLUDES STATE AID

TABLE V

19

To analyze the labor market, employment projections were obtained from the local Michigan Employment Security Commission office (M.E.S.C.), follow-up surveys of students placement were analyzed, and counselors and teachers appraised the market subjectively. The projected "skill placement" numbers shown on Table V are the summation of this work.

The number of training stations for each program (see Column 3) was determined by multiplying the actual number available by two, or the number of sessions the course is offered. Obviously, this number can be increased by scheduling more training sessions in late afternoon, evening or during weekends.

Cost information was developed by projecting 1975-76 costs to 1976-77 costs. Teacher's salary increases were already known and other costs were increased to reflect assumed overall cost increases.

*Interest and Placement Analysis*

The Calhoun test data were analyzed by using the same approach as was used in the Flint example. By comparing interest with placement (1565 to 683) the data indicate that the Calhoun Area Skill Center is preparing people for jobs which are not immediately available at a rate of 2.3 to 1, rather than 3 to 1, as was true in Flint. This does not mean that Battle Creek is doing a better job of training and placement than Flint because in both cases student interest was measured by only one year's enrollment history and by data obtained from only one school district. Interest data is more reliable and accurate when it is obtained for more

than one year. Differences in the state of the local econory can also have a major effect.

Although the overall ratio between interest and placement averaged 2.3 to 1 in Battle Creek, a close examination of the ratios of interest to placement reveals several that are relatively high.

| | |
|---|---|
| Air Conditioning and Refrigeration | 8 to 1 |
| Child Care | 7.5 to 1 |
| Auto Mechanics | 7 to 1 |
| Auto Body | 7 to 1 |
| Landscaping/Horticulture | 5 to 1 |
| Carpentry | 5 to 1 |

In seventeen of the twenty-five occupational areas, the relationship between interest and placement was 3 to 1 or less.

*Cost Analysis*

Projected costs of all twenty-five vocational programs are summarized on Table VI. Note that the projected average cost is $484 per trainee and the projected average cost per placement is $1,209. The range in cost for each expected placement is from $379 for a cosmetologist to $3,920 for an air conditioning/refrigeration repairman. The range of costs for each trainee is from $235 for a cosmetologist to $1,260 for a floor covering installer.

Because cost is a major factor in vocational planning, this process is valuable since it allows the planner to quickly identify programs

that are unusually costly or unusually inexpensive. Those that are exceptionally costly in terms of cost per trainee are: building maintenance, home management, plumbing, and floor covering. Unusually low are cosmetology, retail marketing, landscaping, and carpentry.

By reviewing the cost per trainee placed, the planner can see possible public relations problems in spending money to train students for jobs that do not exist. Five of the programs exceed $3,000 per placement. They are: floor covering, auto body repair, child care, air conditioning/refrigeration and auto mechanics.

TABLE VI
PROJECTED COSTS FOR TWENTY FIVE VOCATIONAL PROGRAMS
CALHOUN AREA VOCATIONAL CENTER
1976-77

| PROGRAM | STAFF COSTS | ALL OTHER COSTS | TOTAL COSTS | NO. OF TRAINEES | COST/ TRAINEE | EXPECTED PLACEMENT | COST/ TRAINEE PLACED |
|---|---|---|---|---|---|---|---|
| Sec. | $56,432 | $18,495 | $74,927 | 120 | $624 | 120 | $ 624 |
| Bldg.Main. | 16,762 | 600 | 17,362 | 20 | 868 | 30 | 578 |
| Welding | 25,500 | 4,500 | 30,000 | 80 | 375 | 35 | 857 |
| Data Proc. | 21,800 | 27,900 | 49,700 | 90 | 552 | 40 | 1,243 |
| Home Mgt. | 19,700 | 1.050 | 20,750 | 20 | 1,038 | 15 | 1,383 |
| Food Serv. | 60,488 | 7,500 | 67,988 | 120 | 567 | 75 | 907 |
| Acctng. | 11,500 | 2,200 | 13,700 | 30 | 457 | 14 | 979 |
| Cosmetics | 20,600 | 2,900 | 23,500 | 100 | 235 | 62 | 379 |
| Health Occ. | 54,100 | 5,500 | 59,600 | 120 | 497 | 80 | 745 |
| Ret. Mgt. | 14,000 | 2,500 | 16,500 | 70 | 236 | 30 | 550 |
| Plbg. | 20,688 | 4,000 | 24,688 | 30 | 823 | 10 | 2,469 |
| Floorcover. | 16,700 | 2,200 | 18,900 | 15 | 1,260 | 5 | 3,780 |
| Land/Hort | 16,230 | 3,400 | 19,630 | 80 | 245 | 15 | 1,309 |
| Elec. | 19,336 | 2,900 | 22,236 | 40 | 556 | 11 | 2,021 |
| Ind. Mech. | 23,900 | 8,000 | 31,900 | 60 | 532 | 30 | 1,063 |
| Auto Body | 20,800 | 7,000 | 27,800 | 60 | 463 | 9 | 3,089 |
| Electronics | 21,488 | 4,300 | 25,788 | 60 | 430 | 15 | 1,719 |
| Agri-Mech. | 23,300 | 3,500 | 26,800 | 50 | 536 | 15 | 1,787 |
| Child Care | 27,500 | 1,200 | 28,700 | 60 | 478 | 8 | 3,588 |
| Air Con/Ref | 17,200 | 2.400 | 19,600 | 40 | 490 | 5 | 3,920 |
| Carpentry | 18,336 | 3,500 | 21,836 | 80 | 273 | 14 | 1,560 |
| Graphic/ | 11,600 | 6,300 | 17,900 | 30 | 597 | 10 | 1,790 |
| Drafting | 17,000 | 2,800 | 19,800 | 40 | 495 | 10 | 1,980 |
| Graphic | 14,700 | 2,200 | 16,900 | 30 | 563 | 8 | 2,113 |
| Auto Mech. | 55,800 | 5,100 | 60,900 | 120 | 508 | 17 | 3,582 |
| Totals | $625,460 | $131,945 | $757,405 | 1,565 | $484 | 683 | $1,209 |

*Cost Comparisons Between Districts*

Costs of vocational educational programs in Flint and Battle Creek are summarized on Table VII to illustrate how the planner can analyze data for comparable programs to find discrepancies and differences when costs are available from two or more districts.

Such cost comparisons should be analyzed keeping in mind that there are dozens of variables that can cause costs to vary from one district to another, especially from one program to another. As shown in this table, each of the test sites has lower costs in some areas and higher costs in other areas. The process of cost comparison is valuable because it encourages the planner to find out why costs for a particular program vary and occasionally points to techniques and methods for lowering costs.

TABLE VII
COST* COMPARISONS OF SELECTED VOCATIONAL PROGRAMS BETWEEN THE FLINT PUBLIC SCHOOLS AND THE CALHOUN AREA SKILL CENTER

| PROGRAM | (COST/TRAINEE) FLINT | CALHOUN | (COST/TRAINEE PLACED) FLINT | CALHOUN |
|---|---|---|---|---|
| Auto Body | $864 | $463 | $2,074 | $3,089 |
| Auto Mechanics | 390 | 508 | 1,651 | 3,582 |
| Electronics | 405 | 430 | 2,226 | 1,719 |
| Graphic Arts | 436 | 597 | 1,162 | 1,790 |
| Welding | 310 | 375 | 1,316 | 857 |
| General Merchandising | 176 | | 636 | |
| Retail Marketing | | 236 | | 550 |
| Nurses Aide | 319 | | 829 | |
| Health Occupations | | 497 | | 745 |

TABLE VII (continued)

| PROGRAM | (COST/TRAINEE) FLINT | CALHOUN | (COST/TRAINEE PLACED) FLINT | CALHOUN |
|---|---|---|---|---|
| Food Management | 427 | | 670 | |
| Food Services | | 467 | | 907 |
| Clerk/Steno | 237 | | 746 | |
| Secretarial | | 624 | | 624 |
| Customer Service | 217 | | 290 | |
| Bldg. Maintenance | | 868 | | 578 |

* Costs shown on this table are the actual 1975-76 costs for Flint programs

The first five programs listed on Table VII have the same title: however, it cannot be assumed that they have the same content, nor do they require the same amount of instructional time or resources. If there are great differences in cost per trainee or cost per trainee placed, the planner should analyze the two programs, their time schedule, the training stations, etc. The differences should be either reconciled, rationalized or a change in program should occur to remove the discrepancy. For example, auto body repair instruction costs $864 per trainee in Flint as compared with $463 in Calhoun. There were 60 trainees in Calhoun and 24 in Flint. Of these, 10 were placed in Flint body repair shops and nine were placed in jobs in the Calhoun County area. Of the $20,735 total cost for the Flint auto body program, $15,779 was spent for personnel. In Calhoun county of $27,800 for the total program, $20,800 was spent for personnel. Why does it cost twice as much to train auto body repairmen in Flint as it does in the Battle Creek area? The answer may lead to some program or staff changes. Some of the differences in cost per placement,

of course, reflect differences in demand for a particular occupation in the two labor markets. Demand could conceivably vary greatly in a relatively small labor market from year to year which would be reflected in total placements.

In another example, note that welding instruction costs three times as much in Calhoun as it does in Flint. Fifty-one are being trained for 12 jobs in Flint where the personnel cost is $11,144, and 80 are being trained for 35 jobs in Battle Creek with a personnel cost of $25,500. From these figures the planner might deduce that there are two rather highly paid teachers with low, class loads (20-1) in the Calhoun Skill Center and one teacher with a high, class load in Flint. It is also possible that welding is a one hour class in Flint and a 2½ to 3 hour class in Battle Creek.

Careful study of cost per instructor or the cost for each trainee placed, can result in decisions that will provide relevant programs in the most effective, least costly manner. The cost data summarized to provide easy analysis of the programs vocational programs can become a valuable tool for the planner.

*Utilizing Results of the Test*

Calhoun planners actually used the Policy Information System, another product of the Middle Cities effort to develop long-range planning for vocational education, to identify program discrepancies and to implement change for the 1976-77 school year. Information on

Table V shows programs where there is low student interest, low manpower demand, and high instructional costs. Programs questioned by the researchers were: building maintenance, food service, child care, and air conditioning.

Because of low manpower need, the child care program was reduced from 50 to 40 students with a staff cut back from 2 teachers and 1 aide to 1 teacher and 1 aide. The net reduction in staff costs was $11,300.

There was low enrollment in the building maintenance program making it possible to cut the program to one half-day session. The teacher now works the other half day as a work study coordinator for other programs making it unnecessary to hire an additional person to handle the increasing work study load.

The food service program enrollment was reduced from 90 to 60 when it was discovered that placement of fully trained workers was low in traditional restaurants and that most of those placed were working in fast service restaurants. The teaching staff was reduced from four teachers and two aides to three teachers and one aide at a personnel cost saving of $17,500. Further reductions in training costs are expected because the program is being modified to provide specific short term training for fast food restaurant service. This training will cost less because it will be done in far less time than the two years for restaurant training.

Training costs for air conditioning and refrigeration mechanics were unusually high. By placing this program under careful scrutiny,

several interesting facts were uncovered. Student interest and graduate placement were stable. There were always two sections of 20 trainees each at the beginning of the year. By mid-year there were only 12 in each group. The teacher had set pre-requisites and "high" performance standards causing students to drop out. The placement percentage for those who were ultimately trained was very high but the number trained was much lower than expected. Corrective measures were ordered to implement the philosophy of the skill center - that there are no pre-requisites for entry into a given program and that the number in a program must be maintained. If one trainee leaves another may enter. The teacher was given assistance in curriculum planning, in developing interpersonal skills and in changing his instructional emphasis from group learning to individual learning.

The Policy Information System clearly provided the impetus for change in the Calhoun Area Vocational Center. It may be partially true that the planning system helps the vocational planner discover the obvious. It sends up a "red flag" if something seems askew in the educational program. It forces the planner to look at the program to discover wnether or not there is a real problem and gives him the "license" to examine all aspects including the staff and the facility. As the Calhoun planner stated, "It became so clear that something had to be done that no one really argued with the findings, including those who had a vested interest in the program."

The Policy Information System forced the Battle Creek Schools to consider the options for long-range planning which were:

a. Rework or redesign the program and methodology
b. Reduce or increase the enrollment
c. Re-examine program goals and objectives
d. Do nothing

The last option, the "do nothing" option was not the decision in Battle Creek. It is, however a viable option and may be most applicable when the factual information is not "clearcut". In some cases local politics or other subjective factors may suggest that the "do nothing" choice is the wisest choice.

## KENT COUNTY-GRAND RAPIDS AREA TEST

The Kent County test varied from the Flint and Calhoun tests because it included three educational agencies, the Kent Intermediate School District, the Grand Rapids Public Schools, and Grand Rapids Junior College. All three are extensively involved in delivering vocational education programs to the Grand Rapids metropolitan labor market. In some cases, the programs offered by these three agencies overlap, and a major goal of the pilot test was to foster greater coordination and communication between the organizations involved in delivering vocational education to a diversified labor market. The very process of bringing these agencies together and the act of establishing communication was so time consuming that the model was not tested during the four month test period. The need for area-wide planning, coordination, and articulation of programs, however, was clearly established during the test period.

*Procedures*

Vocational education is offered in public schools in Kent County by twenty local school districts, the Kent Intermediate School District, through the Kent Skill Center, and Grand Rapids Junior College. Representatives from the Kent Skill Center, Grand Rapids Public Schools, and the Grand Rapids Junior College were selected to serve on a local planning task force as follows:

Wilber Bolden, Placement Officer, Kent Skill Center
Lou Murillo, Administrative Intern, Grand Rapids Junior College

Bill Harrison, Career Education Planning District, K.I.S.D.
Dick McCurdy, Director of Career Education, G.R.P.S.
Barry Boyer, Supervisor of Industrial Arts, G.R.P.S.
Milton Miller, School Planner, G.R.P.S.

During the organizational meeting in January, 1976, several other staff members were asked to join in testing the model. They were:

Dan Ballast, Director of Counseling Services, G.R.P.S.
Bill Reaves, Director of Testing and Evaluation, G.R.P.S.

This local task force met ten times between January and April. During one of the first meetings, the task force decided to limit its work to six vocational program questions: 1) whether large appliance repair should be dropped from the Kent Skill Center program, 2) why there is such high student interest in vocational child care programs but very little placement opportunity, 3) why there is a low student interest among minorities in the construction trades when there is a seemingly high demand in the industry for minority skilled tradesmen, 4) whether the schools should offer programs in welding, 5) whether the schools should offer programs in plastics, and 6) whether the schools should provide assistance to practicing automobile mechanics who would need to become certified under newly legislated Michigan Public Act 300.

One early assumption made by the Middle Cities research staff and task force was that much of the information needed to determine student interest and occupational demand would be available, in some form, at the local level. Some degree of communication between agencies however limited and articulation of similar vocational programs offered by local agencies might also be an early assumption. Neither assumption proved

true in the Kent County experience and such assumptions may not hold in other areas where more than one agency is involved in the delivery of vocational education.

During the initial meeting it was discovered that many of the participants were meeting one another for the first time, that programs were often implemented without careful study of placement opportunities or student interest, and that there seemed to be considerable duplication and repetition in planning and programming for vocational training. There was little question about the need for both short-range and long-range vocational planning. A final discovery was that those on the "firing line" or those involved in managing programs find it difficult to find time for thorough and continuous planning for vocational programs.

In testing the "model" for vocational planning, the local task force analyzed student interest and manpower demand for each of the program areas. Approach and experience varied in each case.

*Interest and Demand - Large Appliance Repair*

Student interest and manpower demand in large appliance repair were measured by reviewing the history of enrollment, holding power in the program, and placement. This history from 1971-1975 is shown on the next page.

Note that approximately one third of the students left the program before completing one year and that only about one third of the students completed the two year program. Wilber Bolden, the skill center placement officer, offers the following comment as an explanation for low student

interest:

"All students desiring to attend the Kent Skill Center must complete an enrollment application. Students make three choices, first, second, and third. They may or may not receive training in programs which were listed as their first or second choice. Because of the limited number of openings in the more popular programs such as Auto Mechanics and Auto Body, a student may be enrolled in his third choice. Large Appliance has never initially reached its maximum capacity of forty (40) students in any of the past five (5) years. Also, there was always a substantial decline in the number of students at the end of the year. Second and third choice may have created some of the problems in program completion and retention," he stated.

In determining manpower demand, Mr. Bolden conducted a survey of 35 large appliance suppliers and service companies. He sent a brief description of the course, its performance objectives and asked six questions. These questions and a tabulation of the responses are shown below:

| | |
|---|---|
| 1. What is your current need for large appliance repairmen? | 0 |
| 2. What is your anticipated need for large appliance repairmen? | 3 |
| 3. Do you feel there is an occupational shortage for large appliance repairmen? | 6 yes, 10 no, 2 no answer |
| 4. Would you hire a job entry level trained large appliance repairman from Kent Skills Center? | 13 yes, 2 no, 3 no answer |

5. Have you had or taken an opportunity to visit Kent Skills Center? 10 yes, 7 no, 1 no answer

6. Are there other jobs that you have difficulty in finding qualified trainees? 1 yes, 14 no, 3 no answer

Only eighteen of the thirty five appliance repair firms responded. Noticeably absent from the list were Sears, and Montgomery Wards, who are large employers of repairmen.

The survey revealed that there is no current need and a future need for only three large appliance repairmen. This finding and the placement history (seven in three years and none last year) seem to support the Board of Education's recent decision to discontinue the program.

Whether the program should be restructured or made part of another similar program, or offered to a larger population base, or at some other skill center should be determined through further study. Perhaps it could or is already being offered as an "on the job" training experience. Discontinuing the program without determining how to meet this need, even though it is a small need, is not satisfactory.

*Child Care*

The task force perceived the Child Care Training Program as one of high student interest and low demand in terms of placement. Child care training programs are offered by the skill center and at Grand Rapids Junior College. Enrollment is restricted because student interest exceeds the number of training stations. The task force did not find "interest"

or job market information readily available. Rather than conduct a separate student interest study, the task force decided to examine the results of the "Student Career Interest Survey" which is described later.

With regard to placement opportunities for child care workers the task force suggested contacting the local United Way office or the State Health Department or other licensing agency to obtain a list of employers of child care workers. Research on opportunities for child care workers is continuing.

*Minority Workers and the Construction Trades*

The developing and implementing of affirmative action programs to place, train, and upgrade minority workers has led to consideration of interest and placement opportunities for this select population. It was perceived by the task force that there is a low interest among minorities for construction training and a high demand for minorities in the construction industry. Very few minority students enroll in the Skill Center construction trades program. A very few more enroll in the Grand Rapids Public Schools Educational Park Program and the Grand Rapids Junior College Program as shown below:

TABLE IX
1975-76 CONSTRUCTION TRADES
PROGRAM ENROLLMENT

| | Minority | Other | Total |
|---|---|---|---|
| Skill Center | 1 | 103 | 104 |
| Educational Park | 3 | 10 | 13 |
| Grand Rapids Jr. College | 3 | 12 | 15 |
| Total | 7 | 125 | 132 |

The demand for minority workers was determined by reviewing affirmative action plans of more than twenty general, mechanical, and electrical contractors who are under contract with the Grand Rapids Public Schools. A better measure of the level of minority worker participation and need will be available when the Grand Rapids Public Schools request and summarize bidder qualification information and affirmative action plans.

*Welding*

Units in welding are offered at the Grand Rapids Junior College, high school industrial arts programs, or as a part of several skill center programs. A welding program was established in September, 1975 for the Grand Rapids Public Schools Educational Park Program. Thirty students are enrolled in the program.

Almost simultaneously, the Grand Rapids Junior College sensed that there was a manpower need and high student interest in welding. A student interest survey was conducted by asking a select group (Technical Ed. Students) three questions. A total of 144 males and only 2 females participated in the study. The questions and results are shown below.

1. If Grand Rapids Junior College had a more comprehensive welding program, would you have considered enrolling in this program?

   Yes 35 No 64 Perhaps 47

2. Would you change your vocational/technical curriculum for the fall semester of 1976 to include an emphasis in welding if Junior College had such a program?

   Yes 15 No 94 Perhaps 37

3. Do you know students in high school or others who would be interested in a welding program if Junior College had such a curriculum?

Yes 65 No 54 Perhaps 27

There seems to be sufficient interest to introduce a welding program in the college. Only tech students were queried, however and these students may transfer from one tech program to another, causing a reduction of participation in other tech programs. The survey did not identify whether students not currently enrolled in technical programs are potential welding students.

In order to ascertain manpower demand, several questions were asked of firms employing welders. A summary of the respondent's replies to some of the questions follows.

1. How many welders do you employ?

| Full Time | | | | Part Time | |
|---|---|---|---|---|---|
| 5 or less | 9 | 30 - 49 | 2 | 5 or less | 2 |
| 6 - 10 | 9 | 250 - 300 | 1 | 6 - 10 | 2 |
| 11 - 29 | 6 | | | | |

2. What is the average annual turnover rate for your welding staff?

| | | | |
|---|---|---|---|
| Less than 1% | 9 | 12 - 15% | 1 |
| 1 - 4% | 2 | 20 - 25% | 3 |
| 5 - 8% | 2 | 26 - 50% | 1 |
| 9 - 12% | 8 | | |

3. How much college and/or vocational welding training do your welding employees have?

| | | | |
|---|---|---|---|
| 1 year or less | 19 | 4 years | 2 |
| 2 years | 2 | BS or beyond | 0 |
| 3 years | 0 | | |

4. If Grand Rapids Junior College were to institute a more comprehensive welding program, how many graduates could you anticipate employing by:

   1977 69 1978 87

5. If Grand Rapids Junior College were to institute a more comprehensive welding program, would you recommend such a program to your current employees?

   Yes 19 No 5

If 69 trained welders are needed by 1977 and another 87 by 1978, some area institution(s) should be programming welding. Interestingly, some respondents to the welding manpower study asked why they were responding to the "need" questionnaire from three organizations. Apparently, the Skill Center, the Grand Rapids Public Schools Vocational Education Department, and the Grand Rapids Junior College were asking the same people the same questions. All three institutions will have welding programs in operation by September, 1976. Will each institution supply the labor market with 70 or 80 welders each year beginning in 1977? If so, there will be three times as many welders as there are openings. This illustration amplifies the need for program articulation between school districts and between high schools, skill centers, and the college.

*Plastics*

Over one year ago, the Grand Rapids School superintendent asked the vocational director whether the schools were preparing students for employment in the plastics industry. The superintendent's inquiry prompted the director to meet with manufacturers and fabricators of plastics to

determine the need for skilled workers. An ad hoc advisory committee was organized to assist in identifying manpower needs, developing the program, planning for the facility and its equipment, and in other planning tasks.

Two surveys were printed and mailed to local industries and to prospective students. The results were still being evaluated at the end of the test period.

In addition, the "Student Career Interest Survey" was to be reviewed for indications of interest in a plastics program. One problem in evaluating the need for a vocational program in plastics is that it is difficult to identify the specific skills required for employment in the plastics industry. For example, mold makers require skills similar to those required by tool and die makers. In addition, the industry needs technicians who are experienced in chemistry and semi-skilled molding machine operators are also essential. The initial survey of the industry will help to identify this need by occupation. The survey may also reveal that the machine metals program needs to be modified to include mold making or that a chemical program should be implemented at the Junior College.

*Auto Mechanic Certification*

Public Act 300 of the State of Michigan was enacted after the local Vocational planning task force had begun its work. The Act requires that all automobile, heavy-duty truck, and motorcycle mechanics be certified.

On March 30, 1976 survey letters were sent to the following:

Amoco Oil Company, district office
President, Association of Independent Garages
President, Grand Rapids Auto Dealer Association
Marathon Oil Company, district office
Mobil Oil Corporation, district office
Past president, Service Station Dealer Association of Michigan
Shell Oil Company, district office
Texaco, Inc., district office

Only three companies responded and their answers were so vague that the task force suggested a mailing to a sample of the 500 area service stations. Every fifth station listed in the "yellow pages" of the local telephone directory was selected. Twenty-seven of the 100 questionnaires were returned. The results are summarized below.

1. Number of mechanics your station currently employs---52
2. Number of mechanics in your station having mechanic certification---6
3. Number of mechanics in your station planning to become certified in one or more categories---44
4. Should local educational institutions be made available to assist mechanics in preparation for certification? Yes--23 No--3 Don't Know--1
5. Do mechanics already have sources to assist them in preparation for certification? Yes--4 No--20 Don't Know--3
   (Junior College - 3)
   (Standard Oil Refresher Course - 1)

The sample survey definitely established a need for programs to meet the certification requirements of Grand Rapids area repair mechanics.

School systems can provide training for local mechanic's certification if courses of study can be developed and training programs can be established in available classrooms, laboratories, or on-site training stations such as

local garages or major service stations.

*Interest Survey*

Each year, during March, all tenth grade students within the Kent Intermediate School District complete the Student Career Interest Survey. Dan Ballast, director of counselling services, describes the survey, its use, its value and limitations as follows:

Traditionally, secondary schools have administered career interest and aptitude tests as a way of assisting students to identify interests and aptitudes already developed. This approach has resulted in several problems:

1. Results do not name specific career options, but only areas of interest or aptitude. Thus, curricular planning based on these results is not possible.
2. The lack of specificity of results does not appear to provide the motivation to students to explore the specific careers within the career areas identified on the tests.
3. The lack of confidence in the results of those tests as predictors of career choice or of success has not provided the motivation to professionals to invest time and effort in assisting students to utilize the results.
4. The time and cost of test administration prevents their administration annually to the same students; therefore, the frequent change in student career interests and aptitudes cannot be accommodated.

We have, therefore, cooperated with the Explorers group in the administration of the "Student Career Interest Survey". This survey utilizes "expressed" career choice rather than tested choice. This approach appears to have higher predictive value. The minimal cost and time needed to administer this survey allows its annual administration and makes accommodations for frequent change of career interests. The fact that results are fairly specific seems to motivate students to follow-up on their expressed choices by engaging in exploratory activities. This also allows guidance, and other staff to respond to the results with specific information for students. Specificity also facilitates curricular planning, Ballast stated.

The 1976 survey is being processed and the task force has asked for responses to the following questions concerning student interest in specified program areas:

1. Is the interest in large appliance repair training really as low as enrollment history indicates or is it lower?
2. How many tenth grade students are interested in the child care program? Are boys also interested in it?
3. How many minority students expressed an interest in the building trades?
4. How many students are interested in welding?
5. How many students are interested in training for the plastics industry?

*Value of the Grand Rapids Area Test*

The Grand Rapids - Kent County experience demonstrates that several months of preparation and planning are required before the Policy Information

System can be employed for vocational planning. Multiple local educational systems and agencies who serve a designated labor market area must collect much of the student interest, student placement, cost, staff, and facility information for it to be truly useful.

The major accomplishment of the test was that a local vocational planning task force was established for the first time in the Grand Rapids metropolitan area. It met regularily and concerned itself with cooperative planning and programming, with articulation of programs between institutions, with eliminating duplicity, and with granting credit interchangeably for similar training programs.

The task force discovered that there are two major forces working against cooperation and coordination between agencies delivering vocational education. The first is the fact that "the name of the game" and the bottom line on the success or failure of a program is placement. Vocational education agencies working in the same region are obviously in competition for these limited placements which are often tied to funding. The second major handicap to increased cooperation between agencies is somewhat related to the first, and is that no real rewards or incentives exist that would encourage increased cooperation, communication and co-ordination.

The task force prepared itself to use the Policy Information System but did not have time to use it in a comprehensive, co-ordinated field test during the time alloted for implementation.

# SUMMARY AND RECOMMENDATIONS

At the beginning of this report it was hypothesized that long-range vocational planning will occur at the local level if there is technology for planning, a data base to which the technology can be applied, and an organizational capacity to manage the process. The need to develop methods to confront planning deterrents---lack of time, training, technology, data, money, and resistance to change established programs, staff, and facilities, was also mentioned. The pilot test of the Policy Information System for Vocational Planning provides some insights and experiences related to these concerns.

*Data Elements*

The data elements identified by the task force were acceptable in all three pilot tests. None of the researchers suggested adding any new elements to the list. All three experienced some difficulty in obtaining reliable data on student interest and manpower needs. Not only was it difficult to obtain but information was not uniform and it was difficult to weigh the data so that it would become reliable for predicting future program and manpower needs.

Data concerning staff, facilities, finance, and programs tended to be quite uniform and more specific than the elements of interest and manpower.

Researchers generally gave more credence to data directly related to the program than to external information about it. Enrollment history

was considered a major indicator of interest and job placement was a major indicator of manpower need.

*Technology For Planning*

The computer programs used to analyze the data in the Flint and Calhoun tests were very simplistic. Programs were rank ordered by each of the variables beginning with student interest and continuing through job placement, and available training stations. These computer programs were prepared to provide examples of the kind of data manipulation that is possible. The potential provided by the computer for answering planners' questions whatever the variables may be, is virtually unlimited. The Calhoun researchers identified programs with low interest, low placement, and high costs. These programs could easily have been found without the computer; however, with more variables and more programs that are less suspect than these were, the computer program will be of value and analysis will be accomplished in less time. The computer based information system was developed to a greater extent after these tests were completed.

*Organizational Capacity to Manage the Planning Process*

It was evident at all three test sites that there is no existing organization for comprehensive long-range vocational planning. The pilot test provided impetus for planning in Calhoun and Flint, but it had impact on only two educational institutions, the Flint City Schools and the Calhoun Skill Center. In Kent County, three of a potential twenty-one

local educational agencies were involved. In this situational planning for multiple agencies, it was difficult, at best, to overcome many of the deterrents to planning including vested interests, resistance to change, and the extensive time required for analysis and planning. Although these deterrents to planning caused the Grand Rapids test of the information system to be less successful in a technical sense, it may produce more long-term impact in that the test process brought various actors together who should be continually cooperating and communicating.

*Recommendations*

The experience gained in running the pilot test and trying to implement planning in the three diverse vocational educational systems resulted in a number of recommendations designed to point out problem areas and possible solutions for districts interested in undertaking long-range planning for vocational education. These recommendations came from the project interns and others involved in the research effort.

1) In the vast majority of school districts, no process exists for long-range planning for vocational education. Such a process must be established and must provide for constant evaluation of vocational programs.

2) Planning won't take place within a school district or skill center unless someone is given the responsibility to do it along with the time, a clear statement of priority, and a budget. Commitment to planning is the key concept.

3) Although one person or group should be given ultimate responsibility for planning, the planning function should be shared by everyone in the community. The wise planner being aware of all the political considerations will attempt to bring some legitimacy to planning by constructing a process which involves the community at large, the school administration and staff, employers and students.

4) A systematic process must be established to gather data on vocational education and to make decisions on what that data should be.

5) Relationships between data elements and decision outcomes must be analyzed over a period of years and in a variety of labor market areas to establish reliability and standards.

6) Instruments for measuring student interest and labor market or occupational demand must be developed and refined. In the area of student interest, more research must take place in the area of adolescent decision-making as it pertains to occupational choice. At present, actual enrollments are the only reliable indicators of student interest.

7) Superintendents and Boards of Education should require an annual audit of vocational programs and manpower needs.

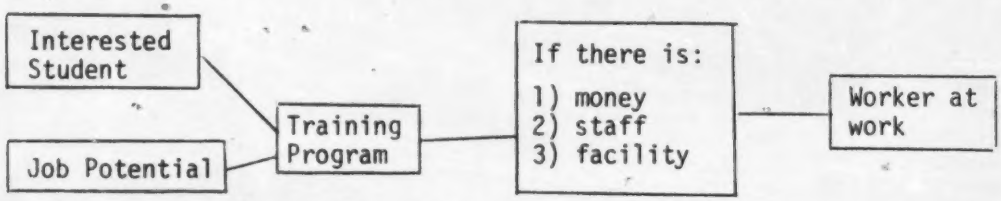
8) A local vocational planning committee should be established within every major labor market area, made up of representatives from all local educational agencies engaged in training workers. The major goals of such a committee would be to foster co-ordination and avoid unnecessary duplication of costly programs as well as monitoring the opportunities and needs of the labor market.

9) Long-range planning for vocational education must be a continuous, iterative process. As the data base is built up and maintained through the years and experience is gained, planning techniques and results will become increasingly refined.

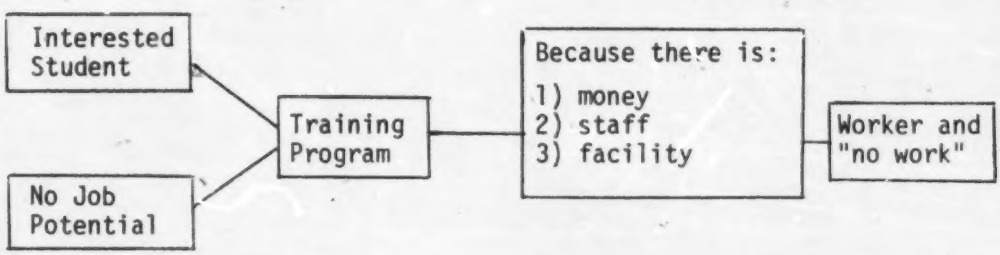
10) The existence of vocational planning and management information systems at the state level is not promoting local planning since local administrators view the annual plan as a compliance document.

*Postscript*

The vocational planning model has evolved from the perspective that, if there is manpower need in the labor market and if there are students interested in training for those occupations, there should be an educational program for bringing the worker and the work together. It is a kind of linear relationship that looks like this:




Unfortunately, sometimes the relationship looks like this:



In reality the process is often not linear; it is circular or orbital. Any of the elements required to train a worker can become a catalyst to initiate planning whether or not there is potential work. Surplus teachers, available facilities, categorical financial aid, or others' success, can provide impetus for programs. Even though one of these elements is weak or missing others may be so strong that the training program is implemented. How many vocational programs were begun because a fully equipped facility or a trained teacher was available, or because state or federal funds existed for a specific kind of training? The unwanted orbital planning model can lead to unemployment, under-employment and disillusionment or to a successfully employed worker.

Vocational planning is a continuous process. It must be done carefully, objectively, and thoroughly so that successful placement of workers into the job market occurs with increasing frequency.

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Planning For Vocational Education

A Policy Information System for Vocational Education

Preliminary Long-Range Planning Model

Vocational Education Summary Planning Program

Data Element Dictionary for Vocational Education

A Ph.D. Program in Education Planning

Planning for Vocational Education: A Selected Bibliography

Policy Information System Computer Program

Implementing Long-Range Planning for Vocational Education

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